

Market Impact of the Pulp and Paper Best Practices Guidebook

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ABSTRACT

Wisconsin's public benefits program, Focus on Energy, in 2005 developed a guidebook for the Pulp and Paper industries that describes the Best Practices for energy efficient processes. The Pulp and Paper Energy Best Practices Guidebook was developed by a team of industry experts and includes new benchmarking information for various types of paper mills. It was developed to motivate the mill manager and to provide them with a quick understanding of energy efficiency opportunities. Because of the unique information and approach of the guidebook TAPPI, the leading association for the pulp and paper industries, picked up the publishing rights in April of 2006.

An independent study performed for Focus on Energy during the fall of 2006 investigated the market effects of the guidebook on the industry's knowledge and actions around the Best Practices that it promotes. The study assessed the awareness of the guidebook, the use of the guidebook as a resource, the influence of the guidebook, and the use of the guidebook to identify opportunities. One of the results of the study showed that within about 18 months from introduction 67% of the market was aware of the guidebook and that 75% of those respondents consulted the guidebook as a resource.

This paper will describe how the guidebook was developed and the process for using it to educate or motivate the industry. It will also review the results of the independent study of the impact of the guidebook on the market and provide conclusions on lessons learned.

Focus on Energy – Purpose and Strategies

Focus on Energy is a public benefits program for the state of Wisconsin to promote energy efficiency and renewable energy projects. It has been a statewide program since July of 2001. It serves both the residential and business sectors. The business sector program is subdivided into four sectors:

- Commercial
- Production Agriculture (farms)
- Schools and Government
- Industrial

In Wisconsin, the industrial sector is particularly important to Focus goals because it uses one third of the electricity and natural gas consumed in the state. The industrial sector uses half of the electricity and natural gas of that consumed by the total business sector in the state. In 2004 the consumption of energy in the Wisconsin industrial sector was 24,329 million kWh, 5,500 MW and 142 Trillion Btu of gas.

The general purpose of the Focus program is to influence the energy project decisions in these various market sectors to impact and increase the overall efficiency of the end-user and the sector. The more specific purpose of the program is maximize the impact on energy efficiency

with the budget that is available. Each year the program sets energy efficiency goals for MWh, MW and therms. Also, each year an independent evaluation is performed to determine the validity of the energy savings claimed. The goals and budget for the Focus programs have increased since its beginning. In the fiscal year for 2006 (FY06) program results for the business program was 140,000 MWh, 24 MW and 10 million therms. The industrial contribution to the results was 50,000 MWh, 6 MW and 5.5 million therms. The FY06 budget for the business programs was about \$16 million and the industrial sector program budget was \$4 million.

The Focus program is continually looking for more effective methods to maximize the impact of the program on energy project decisions and the resulting energy savings with the budget available. The Focus program strategies to meet this objective are to use prescriptive rebates, custom project grants, study grants, general best practice/case study information, and training. The largest expenditure for the industrial program is for the custom grants. These grants represent over 50% of the overall industrial budget. This makes the use of the custom grants very important to the benefit to cost ratio for the program.

Therefore, it is imperative that the custom grant level be set at an amount that provides a good “tipping point” for the projects, but is not providing more money than required to influence the decision. One approach the program uses to minimize the need for larger grant levels is to tie the grants to the educational information that is provided. The Pulp and Paper Energy Best Practices guidebook that will be discussed in this paper is a good example of how the program ties educational efforts to grant offers to maximize the impact of both program tools.

How the Guidebook Was Developed

An important consideration for any efficiency program is to understand where energy is used within a given market sector. The industrial sector is a very diverse and complex market. The uses of energy within the sector are no different. In Wisconsin the primary industrial users of electric and gas energy are:

- Pulp and Paper
- Food Processing
- Metal Casting
- Plastics
- Water/Waste Water

The following table shows the relatively high percentages of energy consumption in these five sub-sectors:

Table 1: Industrial Energy Consumption and Savings Potential by Cluster

Cluster	Industrial kWh (% of Total)	Potential kWh Savings (% of Total)	Industrial Therms (% of Total)	Potential Therm Savings (% of Total)
Forest Products	30	38	18	25
Food Processing	13	13	18	24
Metal Casting	10	4	15	15
Chemicals/Plastics	5	7	10	9
Water/Wastewater	8	8	3	2
TOTAL	66%	70%	64%	75%

Because of the significant percentage of energy use and potential savings in these five sub-sectors, or clusters, targeted program efforts were an important priority. Also, because much of the energy used in these clusters is used for processes, the program wanted to find a way to impact process energy use. The program had already developed best practice information and tools to impact common (non-process specific) systems such as compressed air, pumps and steam systems. This includes our Practical Energy Management[®] approach that provides a template for management and technical best practices. What was missing was strong depth of knowledge and tools related to the cluster processes and barriers to impacting this energy use.

The program decided to develop cluster teams that included experts from the cluster that had strong experience with the key processes and could assist in the development of program information and tools. Many of these experts were recently retired executives that had worked in the industry for many years. They also were not associated with any specific service or product supplier. Relative to the five cluster teams that were developed, the team that had the most experience was the Forest Products or Paper cluster team. This was very important since the Forest Products or Paper industry cluster uses a very significant amount of energy (see Table 1).

The objectives of the cluster teams that were formed included:

- Identifying key process efficiency opportunities
- Identifying key barriers to implementation
- Developing program tools to overcome barriers
- Networking within the cluster to deliver program tools to customers and suppliers
- Connecting program to key associations within the cluster

The Paper cluster team understood that there were many good economical process energy efficiency opportunities that were not being implemented in the paper industry. Some of the barriers to the implementation for projects included:

- Greatly reduced engineering staff to get projects completed
- Lack of capital needed to complete all good projects
- Lack of knowledge to understand the potential energy savings and other benefits of best practices
- Lack of knowledge on how to do a continual improvement approach for energy management
- Mill managers that were not motivated to do comprehensive energy management

These barriers, along with the knowledge of good opportunities not being completed, lead the Paper cluster team to decide to develop a Pulp and Paper Energy Best Practices Guidebook that was aimed at giving mill managers information that would motivate them and their staff to seriously pursue energy management projects. The guidebook includes the following sections:

1. Forward – includes quotes on the usefulness of the guidebook and energy management from key presidents and vice presidents of major paper companies. This was included to provide motivation for the mill manager to dig into the guidebook.
2. Benchmarking – includes a table the lays out energy use per ton of salable paper.
3. Best Practices for Energy Studies – provides essential ingredients of a best practice energy study that should be conducted.

4. Technical Best Practices – includes 55 best practices for projects in the following areas:
- Chemical Pulp Mill
 - Mill Wide
 - Paper Machine
 - Secondary Fiber Plant
 - Thermo-mechanical Pulp Mill
 - Utility Plant
 - Wood Yard

The Technical Best Practice section also includes environmental impact descriptions for 10 of the main best practices. These environmental impact descriptions were included to show the additional environmental benefits to projects that should be considered by the mill and environmental regulatory agencies. Focus has seen examples of where energy efficiency projects are not pursued because of concerns related to environmental agency regulations and possible scrutiny.

How Was Guidebook Distributed and Used by the Program

Once the Pulp and Paper guidebook was completed in May of 2005 we lead off the distribution of the guidebook by teaming with the Wisconsin Paper Council (WPC). They provided us with a time slot at their annual board meeting to make a presentation on the guidebook to their board members. We then gave a copy of the book to each of their 30 board members who are at a high level in their companies. We then sent another 50 copies of the guidebook to contacts that we had at different companies in the state. We followed this up with a site visit by our cluster team experts and a Focus energy advisor to most of the larger companies in the state to discuss the guidebook and encourage its use. The site visits were an critical part of ensuring that the Guidebook was in the hands of the right person and that they understood the information that it provides.

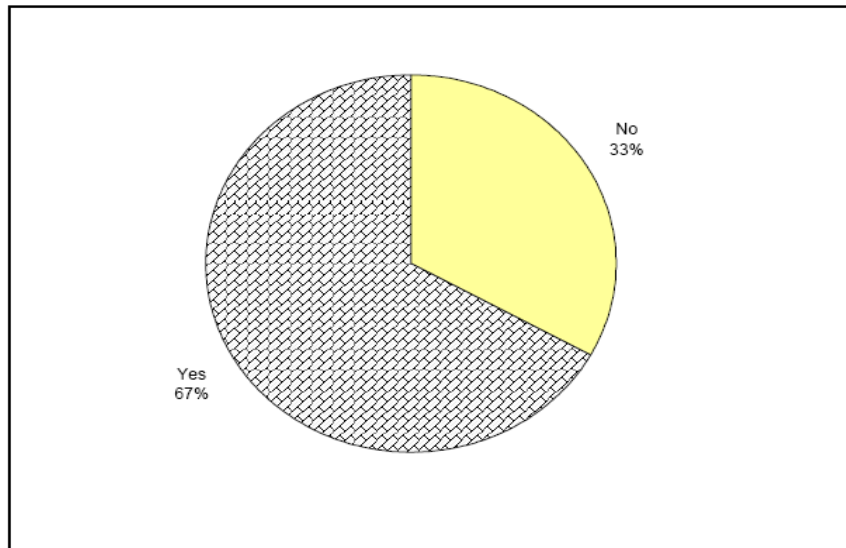
In February of 2006 we joined with the Lake States Technical Association of Pulp and Paper Industries (TAPPI) to do an energy forum. Much of the day was centered around the guidebook and the technical best practices that the guidebook promotes. During this same time the Focus cluster team was working with the national TAPPI organization to hold an international Pulp and Paper Energy Forum in Wisconsin. This was held in May 2006 in conjunction with the WPC annual meeting. Focus worked out an agreement with the national TAPPI group to publish bound copies of the guidebook as a TAPPI publication and these were provide to each attendee of the forum. TAPPI now sells the guidebook on their website as one of their publications.

Additional efforts related to the promotion of the guidebook and the best practices it promotes includes an annual Governor's award for innovate energy efficiency projects in a Pulp or Paper facility. The first award was given at the 2006 WPC/TAPPI Energy Forum and we are continuing the award in 2007. Also, targeted efforts for some of the key best practices in the Guidebook were developed and deployed. These included case studies on dryer management systems and efficient repulping rotors. Along with the distribution of the case studies and Guidebook, a prescriptive incentive was offered on the efficient repulping rotors at \$20 per horsepower.

Market Impact of Guidebook

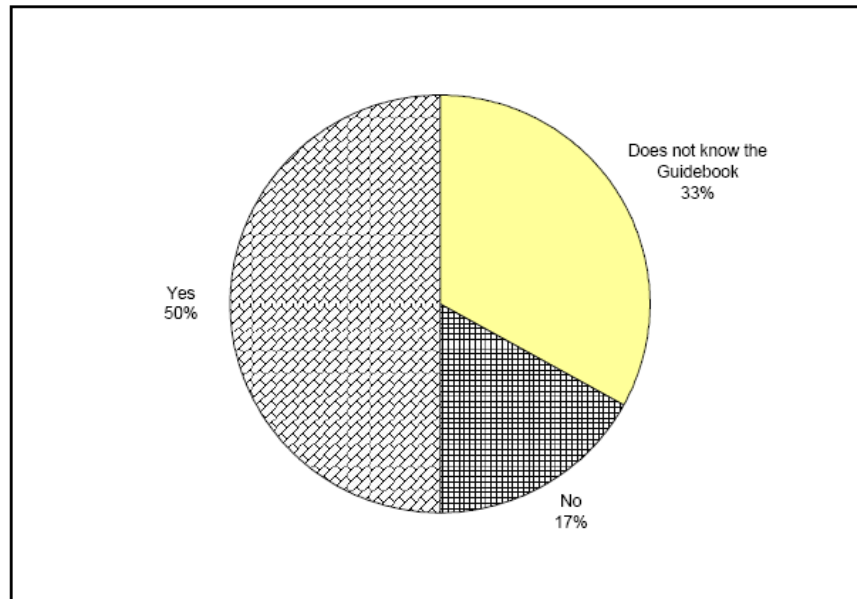
In August of 2006 an independent study was performed to investigate the market effects of the guidebook. The study surveyed 19 pulp and paper customers of different sizes to assess their knowledge and use of the guidebook. The companies sampled represent 63% of the installed capacity for production in the state. One of the findings for the study was that most of the customers (67%) were aware of the guidebook (see Figure 1) after only one year from initial publication. Figure 2 shows the percentage of respondents that learned about the guidebook and use it as a resource. It shows that 50% of the industry has used the guidebook as a resource and this represents 75% of the companies that are aware of the guidebook. This met one of the objectives of the guidebook to make it a useful resource for the industry.

Figure 1. Awareness of the Guidebook
(Percent of Wisconsin's Active Installed Capacity)



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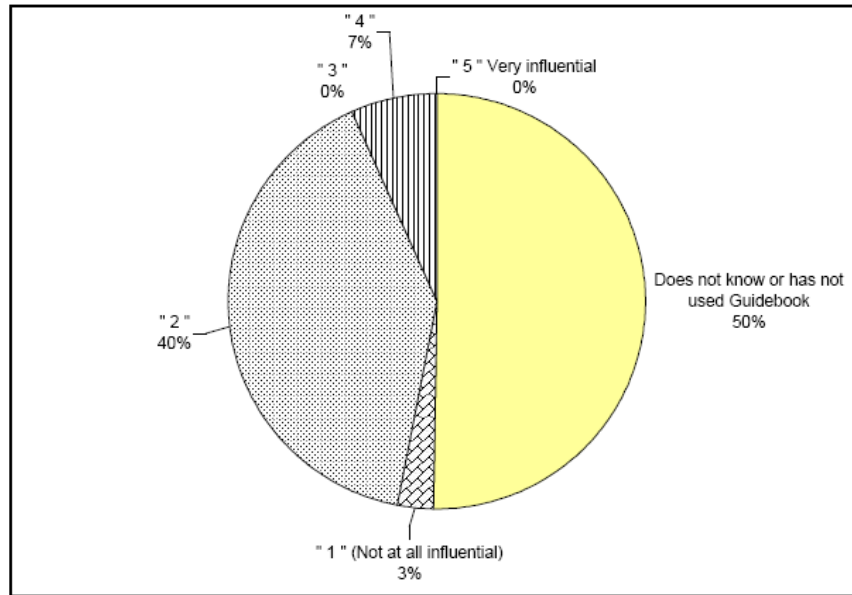
Figure 2. Consulted the Guidebook as a Resource
(Percent of Wisconsin's Active Installed Capacity)



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Another question posed by the survey was on the relative influence of the guidebook on the company's energy practices. Figure 3 show the results of the answers to this question. First it shows that 50% of the industries either did not know of the guidebook or did not use the guidebook as a resource. Only 3% rated the guidebook as "not at all influential" for their energy practices. The largest percentage of those that know about and use the guidebook (80%) answered that the guidebook was had some influence on their energy practices. Although the Focus program would have wanted the guidebook to be a bigger influence on energy practice, these results after only one year are very positive for an educational tool like the guidebook.

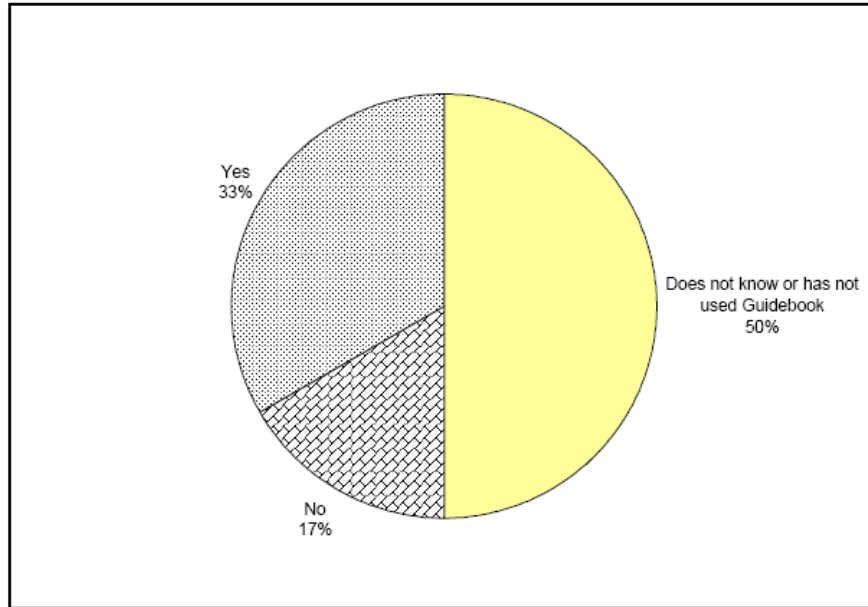
Figure 3. Influence of the Guidebook on Energy Practices Scale of 1 (“not at all influential”) to 5 (“very influential”) (Percent of Wisconsin’s Active Installed Capacity)



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A further dissection of how the customers used the guidebook is provided in their answers to the question on how they used the guidebook to identify process related best practices. As was mentioned earlier, one of the key objectives for the guidebook was to help customers identify possible best practice in their processes primarily because most of the energy use is in their process specific systems. Figure 4 shows that the companies representing 33% of the total installed capacity used the guidebook to identify best practices in their processes. This represents 50% of the companies that have knowledge of the guidebook. This result is very encouraging since the book has only been out one year and is again exceptional for an educational tool in this kind of market.

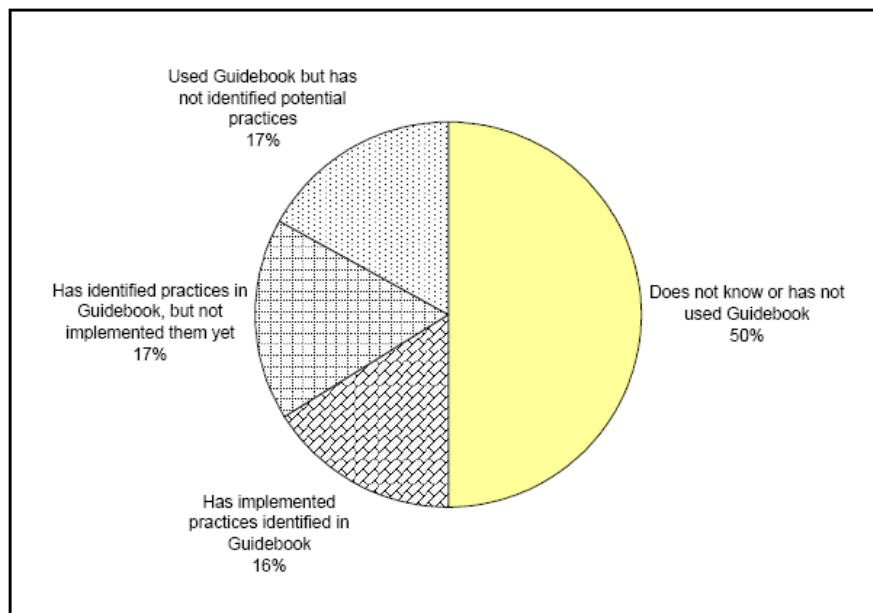
Figure 4. Use of the Guidebook to Identify Relevant Best Practices
(Percent of Wisconsin's Active Installed Capacity)



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The ultimate goal of the guidebook is to influence customers to implement more energy best practices for their processes. Figure 5 shows the results for this goal of the guidebook since it has been issued and it is encouraging. In just this first year, the guidebook has influenced 16% of the industry to implement best practices they identified from the guidebook. This result is good for this type of an educational tool, especially in a complex and conservative industry like pulp and paper. No specific information on actual energy savings resulting from the guidebook was collected, but the program influenced energy savings for the Pulp and Paper industry during this year was 1,200 kW, 7,600,000 kWh and 2,800,000 therms.

Figure 5. Implemented Best Practices Identified in Guidebook
(Percent of Wisconsin's Active Installed Capacity)



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Lessons Learned

The initial results of the market influence of the guidebook seem to be positive, especially for an educational tool. Other lessons learned from the development of the guidebook include:

- A well designed and targeted educational tool can make a significant impact for some industrial customers.
- Engaging experts in the industry provided the ability to create an effective guidebook.
- Site visits were important to build the awareness and use of the guidebook.
- The guidebook offered a good opportunity to meet with different levels of management and engineering within the large Paper customers.
- The guidebook provided a solid reason to build stronger coalitions with organizations and associations within the cluster which greatly increased the programs influence with customers.

References

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Ken Agnew et al, KEMA. *State of Wisconsin Department of Administration Division of Energy - Focus on Energy Statewide Evaluation – Business Programs*. November 10, 2006.